R. M. Burns to Receive Perkin Medal

Robert M. Burns, Chemical Director of the Bell Telephone Laboratories, Murray Hill, New Jersey, has been chosen to receive the Perkin Medal, outstanding honor conferred for achievement in American industrial chemistry. The announcement was made recently by Dr. Gustavus J. Esselen, Chairman of the Award Jury, and Vice-President of the United States Testing Company.

The Jury of Award of the Perkin Medal consists of representatives of the American Chemical Society, the American Institute of Chemical Engineers, The Electrochemical Society, and the American Section of the Société de Chimie Industrielle, in addition to officers of the American Section of the Society of Chemical Industry, under whose auspices the medal is awarded. The formal award of the medal to Dr. Burns is scheduled for January 4, 1952, following a dinner in his honor at the Waldorf-Astoria, New York City.

The Perkin Medal was founded in 1906 in honor of Sir William Perkin, in recognition of his discovery, fifty years before, of the first synthetic dye. It is awarded annually to "a member of the chemical profession residing in the United States for outstanding work in applied chemistry."

Dr. Burns' accomplishments include important applications of chemistry to problems of the communications industry, notably in: the control and prevention of corrosion; the development of storage cells (calcium lead) and electrolytic capacitors (employing aluminum and tantalum); the solution of metallurgical problems of the industry, particularly those of the metalloids and semiconductors used in the highly valuable transistors employed in electronic circuits; the development of ceramic and high polymer (synthetic resin) insulating and structural materials; the artificial growth of large piezoelectric crystals for the control of electronic circuits; and the development of methods of instrumental and micro-analysis required in these fields.

Dr. Burns was born January 9, 1890, in Longmont, Colorado, later moving to Olathe, where he completed his high school training. He was graduated from

R. M. Burns

the University of Colorado in 1915, served there as chemistry instructor, and received the M.A. degree in 1916. He served as a 2nd Lieutenant in the Chemical Warfare Service of the U. S. Army during 1918–19, after which he was granted a fellowship at Princeton University where he received the Ph.D. degree in 1921. His thesis was written on "Adsorption of Gas by Metallic Catalysts."

Dr. Burns' association with the telephone business began at the bottom. At the age of 14 he started his career with the Bell System as first night operator for the newly-established telephone central office in his home town of Olathe, Colorado. Following his graduation from Princeton, he worked for a year as research chemist for the Barrett Company, and in 1922 he joined the Engineering Department of the Western Electric Company, which later became the Bell Telephone Laboratories. The careful work and sound judgment displayed by him there resulted in his appointment as Assistant Chemical Director in 1931. In 1945, Dr. Burns assumed the position he currently holds —that of Bell Laboratories' Chemical Director—where he is responsible for the research work in the field of chemistry performed in the Bell System.

Outside of his assigned responsibilities, he has given unstintingly of his time and effort. For example, The Electrochemical Society has long felt the influence of Dr. Burns' keen interest and wise counsel. He became a member of the Society in 1922 and two years later was elected Secretary-Treasurer of the New York Section and Chairman the following year. He represents the Society on the National Research Council and has served as officer and member of the Board of Directors since his election as Treasurer in 1931, an office which he held for twelve years. He served as President in 1943–44. With the retirement of Professor Colin G. Fink in 1947, Dr. Burns assumed the offices of Secretary and Editor. In the latter capacity, he was largely responsible for the establishment of the JOURNAL of The Electrochemical Society. He continued after 1949 as Consultant to the Editorial Staff and is now Publication Committee Chairman.

Dr. Burns holds memberships in many honorary societies and scientific organizations. He is a Councilor of the American Chemical Society, and has been Chairman of its New York Section. In 1945, the University of Colorado awarded him the honorary degree, Doctor of Science.

An ardent outdoor enthusiast, Dr. Burns is a member of the Appalachian Mountain Club and the Green Mountain Club. He resides in Summit, New Jersey, with his wife, Ada Kneale Burns, and daughter Nadia.

Symposium on Electrochemical Constants

More than 170 leading chemists from various sections of the United States and abroad attended the NBS Semicentennial Symposium on Electrochemical Constants held at the National Bureau of Standards in Washington, D. C., on September 19, 20, and 21, 1951. The symposium was held as part of the scientific program honoring the fiftieth anniversary of the National Bureau of Standards and papers were presented by representatives of industry, universities, and government. The program was organized by Dr. Walter J. Hamer, Chief of the Electrochemistry Section of the Bureau.

The program was divided into six sessions under the chairmanships of Dr. F. B. Silsbee and Dr. William Blum, both of NBS, Dr. George W. Vinal of Princeton, New Jersey, Dr. H. H. Uhlig of M.I.T., Dr. T. F. Young of the University of Chicago, and Dr. R. E. Gibson of the Johns Hopkins University Applied Physics Laboratory. Among the topics considered were the faraday constant, standard cells, transport numbers, electrolytes, conductivity, polarography, electrode potentials, and kinetics.

The Faraday Constant

In recent years, renewed interest has been manifested in the value of the faraday constant. For over thirty years, the discrepancy between the values obtained by the silver and iodine coulometers has been of concern. This problem received major emphasis at the symposium. Dr. A. F. Scott of Reed College reviewed the question of inclusions in the silver of the silver coulometer and described some recent experiments in which radioactive tracers were used to estimate the magnitude of errors arising due to occlusions in the silver coulometer. He estimated that occlusion errors exceed 0.004 per cent.

Dr. D. N. Craig described a new electrochemical method for the determination of the faraday which is free of isotopic effects and occlusion errors. This method of Hoffman and Craig involves the anodic oxidation of oxalate ion. They reported a value of 96,518 coulombs per gram equivalent on the physical scale. Dr. H. Sommer of NBS discussed the first determination of the faraday by a strictly physical method which employs an instrument known as the omegatron. By this method, the faraday is evaluated in terms of the ratio of the magnetic moment to the angular momentum of the proton and the ratio of the spin precessional frequency of the proton to the cyclotron resonance frequency of an ion whose isotopic weight is known. Dr. Sommer reported a value of 96,520 in excellent agreement with the value reported by Dr. Craig.

Electrolytic Conductivity

The electrolytic conductivity of electrolytes at dilutions heretofore not precisely studied was presented by Professor C. A. Kraus of Brown University. Professor Kraus stated that all potassium salts thus far measured exhibit a minimum in their deviation of Onsager's simple theoretical equation. The question of the solvent correction was thoroughly discussed.

Dr. R. F. Fuoss of Yale presented a progress report which proved to be thought-provoking. From measurements of the conductance of electrolytes in mixed solvents, Dr. Fuoss presented evidence that indicated that the properties of such solutions depend on the sequence in which the solutions are prepared, that is, on which of two solvents is first employed to dissolve an electrolyte.

Discussions of electroytic conductivity would not be complete without a discussion of high field conductance (Wien effect). This was discussed for some paraffin-chain electrolytes by Dr. Samuel Gusman of the Rohm and Haas Research Laboratories. Dr. Gusman used field strengths up to 100 kv/cm. In this work Dr. Gusman showed that *n*-tetradecyl ammonium salts behave as uni-univalent electrolytes and that *n*-hexadecyl trimethyl ammonium salts deviate from such behavior.

Transport Numbers

Transport numbers are most frequently determined by Hittorf or moving boundary measurements. Dr. D. A. MacInnes of the Rockefeller Institute for Medical Research described a new method for the determination of transference numbers in which he used an emf-centrifuge. This method differs primarily from the other well-known methods in that the electrodes do not have to carry electric current.

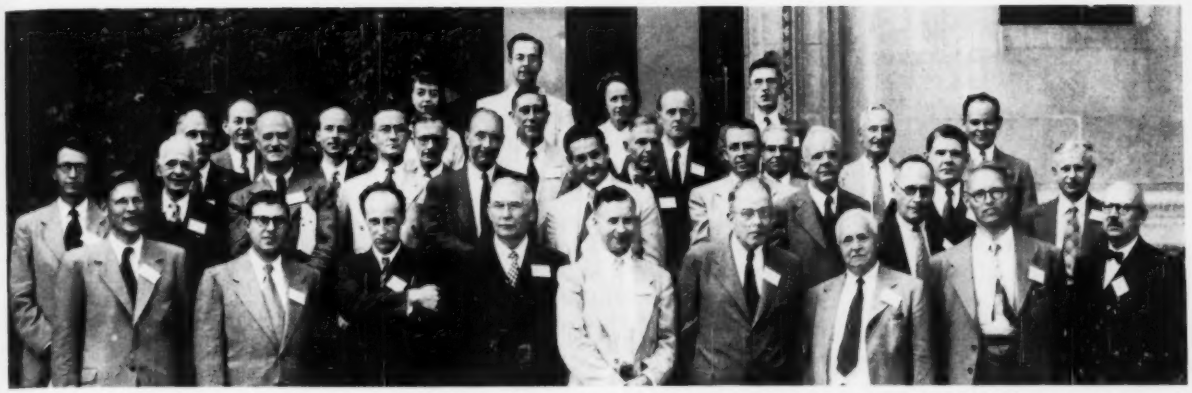
Professor A. R. Gordon of the University of Toronto discussed the general theory of moving boundary measurements and described a moving boundary technique whereby true values of transference numbers can be obtained even if initial indicator concentrations are only one-fifth of the theoretical Kohlrausch value. Dr. L. G. Longsworth of the Rockefeller Institute for Medical Research described the separation of salt mixtures by moving boundaries experiments in "unpacked" channels and presented data showing the influence of $-CH_2-$ group on the mobility of fatty acid anions and corresponding amino acids. Dr. R. A. Robinson of the University of Malaya discussed a paper on "The Analytical Boundary Method for the Determination of Transport Numbers" by M. Spiro and H. N. Parton of Canterbury University College, New Zealand.

Diffusion and Polarographic Constants

For many years, chemists have sought an accurate method for the measurement of diffusion coefficients of electrolytes in dilute solutions. Professor Herbert S. Harned of Yale discussed a new method for the measurement of diffusion coefficients and presented data showing that the measurements were in accord with the theory of dilute solutions. Dr. H. J. V. Tyrrell of Sheffield University, Sheffield, England, reported on some of his recent work on thermal cells or those with temperature gradients, a subject given little attention at the present time in this country. He discussed Soret effects and described at length the experimental difficulties encountered in studies of this type. Dr. Otto H. Muller of the Medical Center at Syracuse University pointed out that no agreement has yet been reached on the numerical values of the Ilkovic equation for the diffusion current in polarographic studies.

Standard Cells

The stability and reliability of standard cells of the unsaturated and saturated type were covered in three papers. Dr. Marion Eppley of the Eppley Laboratory, Inc., presented a complete and comprehensive study of the effect of septa on the performance of portable standard cells of the type used widely in control laboratories, in electronic devices, and in recording instruments. Mr. F. X. Lamb of the Weston Electrical Instrument Corporation released for the first time data on the stability of Weston standard cells. He and Dr. Eppley stressed that unsaturated standard cells



Participants in the Symposium shown here are, *left to right, 1st row:* J. Th. Overbeek, H. B. Callen, J. O'M. Bockris, A. L. Ferguson, O. H. Muller, G. Scatchard, G. W. Vinal, A. J. Rutgers, and W. M. Latimer; *2nd row:* A. L. Pitman (guest), H. S. Harned, W. F. K. Wynne-Jones, R. A. Robinson, H. H. Uhlig, T. Shedlovsky, L. G. Longsworth, F. X. Lamb, D. A. MacInnes, A. R. Gordon, T. F. Young, and E. R. Smith; *3rd row:* M. Eppley, G. D. Vincent, R. E. Wood, D. N. Craig, J. L. van der Minne (guest), H. J. V. Tyrrell, H. D. Crockford, F. B. Silsbee, T. P. May; *4th row:* P. R. Robb, H. Sommer, L. H. Brickwedde, and W. J. Hamer. *Not shown:* A. F. Scott, C. A. Kraus, W. Blum, B. B. Owen, D. I. Hitchcock, R. E. Gibson, R. M. Fuoss, and S. Gusman.

should be calibrated at frequent intervals

Dr. W. J. Hamer of NBS outlined the methods used by the National Bureau of Standards to maintain standards of electromotive force. He also gave comparisons of the United States standard with those of the national standardizing laboratories of England, France, Japan, Germany, and Russia.

Electrode Potentials and Potential Diagrams

Dr. H. D. Crockford of the University of North Carolina described the measurements so far reported on the potential of silver-silver chloride electrodes in aqueous-nonaqueous solutions. Dr. R. E. Wood of George Washington University discussed the factors involved in determining absolute electrode potentials and compared values calculated from thermodynamic data with experimental values obtained from electrocapillary measurements.

Dr. Herbert B. Callen of the University of Pennsylvania gave a masterful presentation of thermoelectric and thermomagnetic effects within the framework of irreversible thermodynamics. He showed that the electrochemical potential is the sum of the electrical and chemical potentials.

Professor Wendell M. Latimer of the University of California discussed the value of potential diagrams in the interpretation of inorganic chemistry and stated that it is now possible to give a very complete thermodynamical interpretation of the oxidation-reduction reactions of every element. He discussed at length disproportionation, the water-oxygen system, and the potential diagrams of uranium, neptunium, plutonium, and americium. He concluded with a diagram showing the interrelation of the ionic entropies of the elements.

Electrolytes

The properties of electrolytes were thoroughly covered in five papers. Activity coefficients were discussed by Dr. R. A. Robinson of the University of Malaya, Singapore, Malaya; effects of high pressures on electrolytic solutions by Dr. B. B. Owen of Yale University; and the problem of dilute solutions of strong electrolytes by Dr. George Scatchard of M.I.T. Dr. Robinson stated that activity coefficients obtained by measurements of emf and vapor pressures apparently differ in some cases suggesting that certain phenomena as yet unrealized may occur in either or both of the methods. Dr. Owen pointed out that ionic equilibria at the bottom of the ocean are distinct from equilibria at the surface. Dr. Scatchard discussed a new theory of interionic attraction that promises to surpass that of Debye and Hückel in explaining the behavior of ions in dilute solutions.

On the other hand, Professor W. F. K. Wynne-Jones of the University of Durham, Newcastle Upon Tyne, England, dealt with weak electrolytes. He stated that little can be done to separate the electrostatic and non-electrostatic contributions to ionization constants until more is known about the nature or structure of the liquid state. Professor D. I. Hitchcock of Yale University stressed the fact that a standardization of the *p*H scale can have real significance if attempts are made to relate this scale to thermodynamic ionization constants of weak electrolytes.

Electrode Kinetics

In recent years work on the phenomena that occur at electrode surfaces has been active. In the symposium four papers were devoted to this problem. Dr. A. L. Ferguson of the University of Michigan reviewed the various theories of overvoltage and discussed at length "transfer resistance." Dr. J. O'M. Bockris of the Imperial College of Science and Technology, London, described experiments done in his laboratory to elucidate the complicated processes that occur at electrode surfaces. He stressed the necessity of establishing the purity of solutions under investigation and listed values of parameters of electrode kinetics.

Dr. J. Th.G. Overbeek of the van't Hoff Laboratory, University of Utrecht, The Netherlands, spoke on the significance of constants involved in electrochemical double layers. He contrasted the behavior of perfectly polarizable electrodes with the behavior of perfectly reversible electrodes. Dr. Overbeek stated that although the zeta potential cannot be precisely evaluated it remains a useful concept. Dr. T. P. May of the International Nickel Company gave the results of extensive studies done at the Marine Corrosion Laboratory at Harbor Island, North Carolina, on the corrosion of mild steel in sea water. Dr. May pointed out that a table of irreversible "corrosion potentials" of metals is a more useful index of probable behavior of metals in corrosion studies than a table of reversible electrode potentials.

Electrokinetics

Electrochemical constants involved in the general field of electrokinetics were discussed by Dr. A. J. Rutgers of

the University of Ghent, Ghent, Belgium. His discussion included the results obtained in his laboratory over the past 15 years. He spoke at length on electrophoresis, electro-osmosis, and ultrasonic vibration potentials, and emphasized his work on streaming potentials and currents. He presented several slides showing unique apparatus employed in his investigations.

Proton-Protode Reactions

Dr. Theodore Shedlovsky of the Rockefeller Institute for Medical Research presented a novel scheme to explain the source of electromotive force in systems free of metallic conductors. This involves proton-protode exchange instead of the more familiar electron-electrode exchange. His concept is of great importance in explaining energy precursors for bioelectric phenomena.

* * *

A part of the social program of the symposium included a tea at the residence of Dr. and Mrs. E. U. Condon, and a dinner at the Kennedy-Warren Hotel. Dr. F. B. Silsbee served as toastmaster at the dinner. The dinner was followed by remarks of Dr. J. A. Christiansen of the University of Copenhagen, of Dr. A. J. Rutgers of the University of Ghent, and of Dr. F. G. Brickwedde of the National Bureau of Standards.

BOUND VOLUMES

Members of the Society who wish to have their 1951 JOURNALS bound may do so by making arrangements with:

Moore & Company, Inc.
2201 Garrett Avenue
Baltimore 18, Maryland

The collected copies of the JOURNAL should be sent directly to the binder. The binding used will match the 1950 volumes (red simulated leather). The price, including postage, will be $3.25 for binding the complete JOURNALS or $3.75 for binding the technical section and index only. Delivery time will be four weeks after receiving JOURNALS. To avoid error be sure that your return address is clearly marked on the package of JOURNALS sent to the binder.

Requests for this service should be directed to the binder and *not* to the Society.

Ontario Takes Lead in Further Development of Niagara Power

Diversion of additional water from the Niagara River for power generation by the two countries concerned has been agreed upon by a 50-year treaty ratified June 15, 1950, by Canada, and on August 9, 1950, by the United States. At present, about 35 to 40 per cent of the stream flow of the Niagara River is being utilized, and this is to be eventually increased to a maximum of 75 per cent during the night hours.

Construction of Project

The publicly-owned Ontario Hydro-electric Commission system has completed the engineering and, early this year, started construction of the first of two main projects which will use the Canadian share of the additional permissible diversion. This present project will involve the conducting of 20,000 cubic feet per second of water from a point above the Upper Rapids on the Canadian side, through an underground tunnel and an open canal to the edge of the Lower Gorge, just upstream from the present Queenston generating station. There the water will drive six new 75,000 kw generators to produce 450,000 kw of hydroelectric power. This compares with 392,000 kw developed from 16,000 cfs by ten generators in the Queenston station, which is now 30 years old.

The tunnel will be bored 51 ft in diameter through solid rock, and will be lined with reinforced concrete to a finished inside diameter of 45 ft. It will extend for 5 miles under the city of Niagara Falls, Ontario, at a depth of 300 ft below the surface.

A parallel tunnel of the same size will be drilled for the second phase of the project at some later date. The four work shafts now being installed to carry on the drilling program are offset so that they may also serve for the construction of the second tunnel when the time comes.

The water will climb to the surface at the north end of the tunnel and flow from there to the forebay of the new generating station through an open canal, which is to be built for an ultimate capacity of 40,000 cfs, so that it will serve both the tunnel now being built and the future tunnel that will complete the program. One of the engineering problems of this canal is carrying it across the buried gorge of the ancient St. Davids River, which was filled in with glacial debris at the close of the most recent Ice Age.

The water turbines and electric generators will be located at the foot of the gorge wall adjacent to, and just upstream from, the present station. The substructure of the new powerhouse will be blasted out of rock and installed at a depth of 25 ft below the river level. Suitable coffer dams will be built to keep the river out of the construction area.

To transport heavy equipment to the new station, a two-lane highway has been built along the face of the gorge, from the top near the entrance to Niagara Glen to the river level at the powerhouse. This road has a maximum grade of 6 per cent and is 1¼ miles long. It will be an added scenic attraction for motorists, once the construction period is over.

Three of the six generators are scheduled for operation by 1954, and the remaining three by 1955. A recent press announcement indicated that a seventh generator, the first of the final six, will be added to the present program, since it is believed that the tunnel will have enough capacity to serve it. The estimated cost of this first half of the ultimate development is $157,000,000.

American Developments

On the American side, the treaty of 1950 on water diversion makes additional water available for power generation. Full head development of power in the Lower Gorge has been in the minds of our engineers ever since 1918, when no less than eight plans were submitted to the U. S. Army Engineers by the private power companies then operating at Niagara Falls.

The original American powerhouse, completed in 1895, was located above the falls. Eight years later, the first Schoellkopf station was built in the gorge, just below the falls. The need for more power during World War I led to expansion of this station, first in 1920, and again in 1924. This latter expansion provided sufficient turbine capacity in the Schoellkopf station to utilize all the water allotted to the American side, and the up-river Adams station was shut down and held in standby condition.

In recent years, the "redevelopment" of the power potential on the American side of the river has been given intensive study, particularly by the Niagara Falls

Power Company and its successor, the present Niagara-Mohawk Power Company. This private company has developed detailed plans, and has shown its willingness and ability to construct and finance a comprehensive Lower Gorge power plant that will use the maximum potential of the water allotted, by filing an application for permission to proceed with the program. Action on this application, however, has been deferred, pending the working out of similar plans looking to development with state or federal funds by the New York State Power Authority or the Federal Power Commission.

With private plans ready for action immediately, it is evident that the large amount of additional power that could be produced in the projected Lower Gorge plant will be lost to industry and the public for the period required for these rival plans to be worked out, and a decision reached as to what agency is to do the job. P.S.B.

Instrumentation Sessions Planned for Spring

Among the symposia planned for the Golden Jubilee Meeting of the Society, to be held in Philadelphia, May 4 to 8, 1952, are two sessions on Instrumentation. Under the sponsorship of the Electronics Division, these sessions will cover: (1) Methods of Analysis Based Upon Faraday's Law, and (2) Modern Instruments for Chemical Analysis. The first session will be limited to papers dealing with instruments or techniques in the field of batch or continuous coulometric titration. The second session will include papers concerning new or improved instruments in the field of analytical chemistry, or new applications of existing instruments in this field.

Papers for this program are now being solicited by the Electronics Division, and those who have appropriate contributions are invited to send tentative titles of papers to R. H. Cherry, Leeds & Northrup Company, 4901 Stenton Avenue, Philadelphia 44, Pennsylvania. Titles should be accompanied by a brief statement of the scope of the paper and must be received by Dr. Cherry not later than December 15, 1951.

Aluminum Smelting Plant in Texas, for Alcoa

Construction work is scheduled to begin at once on the new aluminum smelting plant to be built by Aluminum Company of America at Rockdale (Milam County), Texas.

The metal-producing facilities are expected to be in partial operation late in 1952, with full capacity reached in 1953. The plant's aluminum production will be about 170,000,000 pounds annually.

John D. Harper, formerly with Alcoa's Tennessee Operations, has been named works manager for the Plant.

Pictorial Highlights of Detroit Meeting—October 9-12

Wagner Bros.

Top row, left to right: Former Presidents Frank C. Mathers and William Blum, with former Vice-President O. W. Storey; Past President Charles L. Faust, Vice-President Marvin J. Udy, Divisional Editor W. C. Gardiner, and Membership Committee Chairman Lyle I. Gilbertson; General Chairman of the Convention Wright Wilson; Mrs. Heise and former President George W. Heise.
Center row: Mrs. Heussner and Mrs. Wagner at the Carl E. Heussner Memorial Luncheon; Paul Ackerman of the Chrysler Corporation, speaker at the Heussner Luncheon; President R. M. Hunter presenting first Palladium Medal to Carl Wagner of M. I. T.; Dr. and Mrs. Lee O. Case of the University of Michigan, Society Secretary Henry B. Linford and Mrs. Linford, J. W. Cuthbertson of the Tin Research Institute, Middlesex, England, and Charles F. Bonilla of Columbia University.
Bottom row: Partial view of Palladium Medal Banquet; group enjoying entertainment preceding Wednesday's informal dinner; ladies at Friday luncheon.

Activities of the Board of Directors

Condensed from the minutes of the meeting of the Board of Directors, held October 9, 1951, at the Statler Hotel, Detroit, Michigan.

The Secretary announced that the present status of the mail vote on the Constitutional changes was 731 for, 6 against. Therefore, the Board of Directors officially declared the new Constitution in force.

The Electronics Division requested authority from the Board of Directors to preprint extended abstracts, not in excess of 1,000 words, of all papers to be presented at technical sessions. These abstracts are to contain the pertinent tables, curves, and drawings. It has been investigated and found that such preprinting does not constitute publication, and Dr. Froelich, Chairman of the Electronics Division, suggested that the Electronics Division collect dues from its members in order to have a working fund and then sell the preprints for an amount sufficient to cover all costs. Permission to try this for the Philadelphia Meeting was granted.

Dr. Hiram Lukens, General Chairman of the Philadelphia Meeting, in the spring of 1952, reported that considerable progress is being made in the preparation of plans. Since this is to be the 50th Anniversary Meeting, it is the intention of the local committee to emphasize the historical aspects of the Society. Dr. Burns, reporting for the Publication Committee, outlined the plans for the JOURNAL for the 50th year as follows: The January issue will contain letters from charter members, old pictures, and in general will emphasize historical aspects of the Society. The ensuing months will then be devoted primarily to interests of a particular Division as follows:

February—Electrodeposition
March—Electrothermic
April—Electonics
May—Rare Metals
June—Electro-Organic
July—Electric Insulation
August—Battery, Secondary
September—Battery, Primary
October—Corrosion
November—Industrial Electrolytic
December—Theoretical Electrochemistry

Each issue will contain a review of the field with particular reference to the part the Society has played in its development. As near as possible, the technical sections will contain papers dealing with the particular field being emphasized.

Mr. F. L. LaQue, Business Manager of the JOURNAL, reported that:

1. The cost of printing and mailing the 1951 JOURNAL will be from $1500 to $2000 below the budget allowance.
2. There will be no loss on the sale of the bound volume 97. A profit of about $70 may be realized.
3. The profit so far on the sale of reprints has been about $400.
4. Net advertising revenue for 1951 is estimated at about $3000.
5. Net advertising revenue for 1952 is estimated at $10,000.
6. The budget for printing a larger amount of technical material in 1952 will have to be increased by only $1000.

On the recommendation of the Ways and Means Committee, the Finance Committee was instructed to prepare a definite proposal for investment of a large portion of our funds in open-end investment trusts.

The future meeting places for the Society as recommended by the Ways and Means Committee were approved as follows:

Fall, 1953—Wrightsville Beach, N. C.
Spring, 1954—Pittsburgh, Pa.
Fall, 1954—Boston, Mass.
Spring, 1955—Cincinnati, Ohio
Fall, 1955—Baltimore, Md.
Spring, 1956—San Francisco, Calif.
Fall, 1956—Cleveland, Ohio

The Ways and Means Committee also recommended the following action with regard to the semiannual meetings of the Society: first, that technical sessions be limited to two simultaneous sessions; second, that one round table may be scheduled parallel with the two technical sessions; third, that the technical sessions last from three to four days, depending upon the demands of the various divisions involved; fourth, that technical sessions start preferably on Monday morning.

At the recommendation of the Ways and Means Committee, the Board of Directors were instructed to study the possibility of authors for a suitable textbook on Theoretical Electrochemistry.

It was decided that the Society should sponsor a round-table discussion at Philadelphia dealing with the teaching of electrochemistry. At the same time, Dr. Ferguson requested and received permission to hold a symposium on bio-electrochemistry and tentatively scheduled it for the New York Meeting, spring 1953.

It was announced that Dr. R. M. Burns, nominee of The Electrochemical Society, will be awarded the Perkin Medal in January.

Mr. Walter Prine, Chairman of the Sustaining Membership Committee, reported that three new sustaining members have been added to our list since this past spring.

It was also announced that Dr. Carl Wagner would present the Palladium Medal Lecture on Thursday, at 4:30 P.M., and receive the medal at the banquet Thursday evening, October 11th.

The winners of the Prize Essay Contest were announced as follows: first prize winner Mr. Robert Auerbach, The Bronx, New York City; second prize winner Mr. F. L. McGeary, New Kensington, Pennsylvania.

HENRY B. LINFORD, *Secretary*

Electro-Chemical Museum Planned in India

An Electro-Chemical Museum is being set up by the Central Electro-Chemical Research Institute in Karaikudi, India, one of eleven National Laboratories set up by the Council of Scientific and Industrial Research of which Prime Minister Jawaharlal Nehru is President.

This Museum is intended to impress the visitor with the increasing importance of electrochemical research in chemical industry. Dr. A. Jogarao, Planning Officer of the Institute, has written to a number of American firms soliciting material for exhibit. He has suggested that samples, charts, models, photographs, specimens, ores, raw materials, and finished products representative of the field of electrochemistry would be welcome.

The Electrochemical Society has a direct interest in this exhibit, since Dr. B. K. Ram Prasad, President of the India Section, is one of the members of the Institute's Planning Committee, and Dr. Jogarao, Planning Officer, is a Society member. This request offers an opportunity for American electrochemists to make a practical contribution to our colleagues overseas in their efforts to promote interest in the rapidly growing field of electrochemistry in India. Correspondence should be addressed to:

Dr. A. Jogarao, Central Electro-Chemical Research Institute, Karaikudi, S. India.

New Fluorochemicals Unit in Operation

Minnesota Mining & Manufacturing Company, St. Paul, Minnesota, has announced full-scale operation of the world's first unit for making fluorochemicals in semicommercial quantities electrochemically. The production is based on a process developed and patented by Dr. J. H. Simons of the University of Florida.

The fluorochemicals serve as a new group of chemical intermediates for use in the manufacture of other products, giving them greater weather and fire resistance, greater heat and chemical stability, unusual optical qualities, and greater surface activity. Among products expected to be affected are resins and coatings, pharmaceuticals, dyes, polymers, solvents, refrigerants, paints and varnishes, dielectrics, coolants, and others.

The new quarter-million-dollar unit, located near Hastings, Minnesota, provides 60,000 feet of floor space in a one-story brick building.

International Committee "Proceedings" Available

Announcement has recently been made of publication of the "Proceedings of the Second Meeting of the International Committee of Electrochemical Thermodynamics and Kinetics." This volume of over 400 pages will be of interest to students of corrosion fundamentals and is available to members of The Electrochemical Society at a reduction of 20% on the full price of $6.00. Those who wish to secure copies at the indicated price should communicate directly with the Secretary of the Committee (Dr. Marcel Pourbaix, University of Brussels, Belgium), or with the publisher (Libreria Editrice Politecnica Cesare Tamburini, Via G. Pascoli, 55, Milan, Italy). In requesting the discount, reference should be made to membership in The Electrochemical Society.

Arthur D. Little Opens Latin American Office

A Latin American office has been opened in Mexico City by Arthur D. Little, Inc., Cambridge, Mass. In making the announcement, Mr. E. P. Stevenson, president of the consulting research and engineering organization, said that the new office will serve the company's growing number of Latin American clients and will also be valuable in conducting surveys and investigations for U. S. clients interested in the industrial expansion now taking place in many parts of Latin America.

The office is headed by Richard W. Plummer, who until recently was vice-president of E. R. Squibb & Sons de Mexico. It is located at Edificio International 963, Reforma 1, Mexico 1, D.F.

SECTION NEWS

Chicago Section

The Chicago Section held its first meeting this season on October 5th, in joint session with the local section of the American Electroplaters' Society, at the Chicago Engineers' Club.

Dr. Dennis R. Turner of Westinghouse Electric Corporation, East Pittsburgh, addressed the gathering on the subject "Periodic Reverse Copper Plating."

HOWARD T. FRANCIS, *Secretary*

Midland Section

The Midland Section opened its season with a meeting on September 27th, at the Dow Auditorium, held jointly with the local section of the American Chemical Society.

Dr. J. O'M. Bockris, of the Royal College of Science, London, was the guest speaker, and was introduced by Dr. H. A. Robinson, local chairman. Dr. Bockris gave his talk on "Overpotential" in which he described the effects of overvoltage in particular cases, and also described some means of measuring overvoltage. [This address appears in full in the November issue of the JOURNAL, page 153C.]

Approximately 75 members of The Electrochemical Society and the American Chemical Society were present.

W. R. PERRY, *Secretary-Treasurer*

Washington-Baltimore Section

The Washington-Baltimore Section announces plans for a special symposium to be held at their December 20th meeting. The subject of the symposium will be the electrowinning of manganese, chromium, and some special elements such as antimony. Dr. R. S. Dean of the local Section will act as panel director and is arranging for at least three speakers.

J. C. WHITE, *Secretary-Treasurer*

DIVISION NEWS

Corrosion Division

The new officers elected by the Corrosion Division at its meeting in Detroit, on October 10th, are as follows:

Chairman—Harry R. Copson, International Nickel Company, Inc., Research Laboratories, Bayonne, N. J.

Vice-Chairman—F. W. Fink, Battelle Memorial Institute, Columbus, Ohio

Secretary-Treasurer—J. M. Bialosky, Koppers Company, Inc., Pittsburgh, Pa.

NORMAN HACKERMAN, *Past Chairman*

Electric Insulation Division

The Electric Insulation Division, at its meeting in Detroit on October 10th, announced the election, by mail ballot, of the following new group of officers:

Chairman—Thomas D. Callinan, Naval Research Laboratory, Washington, D. C.

Vice-Chairman—John D. Chapman, Institute of Cooperative Research, Johns Hopkins University, Baltimore, Md.

Secretary-Treasurer—Ralph A. Ruscetta, General Electric Company, Pittsfield, Mass.

JOHN F. GALL, *Past Chairman*

Electronics Division

At the business meeting of the Electronics Division in Washington, in April 1951, there was much discussion concerning the advisability of preparing condensations of the papers given at the Electronics Division Symposia. It was felt that quick dissemination of the new information being reported would aid materially the workers in these fields. Accordingly, the Executive Committee has surveyed ways and means to provide such information and has presented the plan to the Society's Board of Directors for approval. This approval was granted at the Board Meeting in Detroit.

At a subsequent meeting of the Executive Committee in Detroit, the following decisions were made:

1. Abstracts of the papers to be given at the Philadelphia meeting (Spring 1952) will be printed as a booklet. These abstracts will average about 1000 words and may contain essential tables and figures; it is planned to print the booklet so that it will be available at the meeting.

2. To finance the project, Divisional dues will be assessed for 1951

and 1952 ($1 per year). Half of these Divisional dues will be applied as a rebate to members purchasing the abstract booklet.

Division members will be advised of the details shortly.

A very successful meeting on Screen Application of Phosphors was held at Detroit, with A. E. Hardy presiding. This topic has received much attention and the Electronics Division will sponsor further discussions on it.

Plans are being formulated for holding four symposia or round tables at the Spring Meeting at Philadelphia—Luminescence, Rare Metals, Phosphor Application, and Instrumentation.

J. R. Musgrave, *Secretary-Treasurer*

Electrodeposition Division

Forty-eight Electrodeposition Division members attend the annual Division luncheon and business meeting at Detroit on October 12th. Chairman R. A. Woofter presided at the brief business session. Dr. F. A. Lowenheim presented a discussion of the situation regarding royalties to be received from the revised edition of *Modern Electroplating*. Dr. Lowenheim explained that all royalties from the book would come to the Division treasury and that this would build up a surplus fund for which no need was foreseen. The Electrochemical Society Monograph Series plan was then described. This plan allots 60 per cent of the income to the Society and 40 per cent to the Division sponsoring the Monograph. Dr. Lowenheim made a motion that the royalties from *Modern Electroplating* be distributed in the proportion provided by the Board of Directors for the Monograph Series. The motion was passed by a majority vote with no opposition votes.

Cloyd A. Snavely, *Secretary-Treasurer*

PERSONALS

Joseph L. Wood, Jr. of the Mathieson Alkali Works, Niagara Falls, N. Y., has been appointed Operations Manager of Mathieson Alabama Chemical Corporation, a new subsidiary of Mathieson Chemical Corporation.

Matam P. Murti is now with the National Carbon Company, (India) Ltd., Calcutta, India. Mr. Murti was previously located in Madras, India.

Henry R. Friedberg has joined the Engineering Department of the F. C. Russel Company, Cleveland, Ohio, as chemical engineer and metallurgist. Mr. Friedberg was formerly at The Radiart Company, Cleveland.

Charles H. Moore has left National Lead Company, Titanium Division, South Amboy, N. J., to become Division Manager of P. R. Mallory & Co., Inc., Indianapolis, Ind.

James J. McIntyre has been named Plant Manager of the Memphis plant, Electrochemicals Department, E. I. du Pont de Nemours & Co., Memphis, Tenn. The Memphis plant is now under construction with initial operations scheduled for the second quarter of 1952. Mr. McIntyre came from the Du Pont Company's Niagara Falls plant.

Clare L. Milton, Jr. has been placed in charge of development at Plastic Specialties Company, Baltimore, Md., a subsidiary of Eastern Venetian Blind Company.

Nelson C. White, formerly of Carlsbad, N. Mex., has been appointed General Manager, Potash Division, International Minerals & Chemical Corp., Chicago, Ill.

H. L. Barneby, formerly Chlor-Alkali Department manager for the Blaw-Knox Construction Company, has established his own business in Pittsburgh, Pa., (P. O. Box 144) for the selection, evaluation, and licensing of important chemical processess.

Walter J. Dremann has been elected General Manager of Solar Electric Corporation, Warren, Pa., affiliate of Sunray Electric, Inc., where he was previously employed.

George T. Motock has accepted a position as research engineer at Union Carbide and Carbon Research Laboratories, Niagara Falls, N. Y. He was formerly located in Cleveland.

Frank E. Nabers has transferred from Great Lakes Carbon Corporation, Chicago, Ill., to the company's plant at Morganton, N. C.

George Glockler was in charge of the three-session Symposium on Bond Strengths at the Diamond Jubilee meeting of the American Chemical Society. This was reported to have been "by far the most popular symposium of the meeting" as evidenced by the overflow crowds in attendance.

NEW MEMBERS

In October 1951 the following were elected to membership in The Electrochemical Society:

Active Members

Thomas C. Breitner, Percy E. Landolt, Consulting Engineer, mailing add: 187 Pinehurst Ave., New York 33, N. Y. (Battery, Electrodeposition, Electro-Organic, and Theoretical Electrochemistry)

Robert T. Foley, General Electric Company, 100 Woodlawn Ave., Pittsfield, Mass. (Corrosion)

Henry F. Frailey, Westinghouse Electric Corp., Box 284, Elmira, N. Y. (Electronics)

William E. Medcalf, The Eagle-Picher Company, mailing add: 720 N. Pearl, Joplin, Mo. (Electronics)

Daniel C. Oakley, Ray-O-Vac Company, 212 E. Washington Ave., Madison, Wis. (Battery)

Carrol G. Sexe, Ray-O-Vac Company, 212 E. Washington Ave., Madison, Wis. (Battery)

Associate Members

Robert E. Pereles, Pereles Bros., Inc., 2484 S. 7th St., Milwaukee 15, Wis. (Electrodeposition)

Sidney B. Smith, Westvaco Chemical Division, 405 Lexington Ave., New York 17, N. Y. (Industrial Electrolytic)

Student Associate Members

John J. Hoekstra, Wayne University, mailing add: 118 Eastern Ave., N.E., Grand Rapids 3, Mich. (Electro-Organic and Theoretical Electrochemistry)

Natalie H. Mayer, New York University, mailing add: 105 Christopher St., New York 14, N. Y. (Corrosion)

ANNOUNCEMENTS FROM PUBLISHERS

Gmelins Handbuch der Anorganischen Chemie—8th Edition

The Society has recently received information from Verlag Chemie, Weinheim/Bergstrasse, Germany, concerning the present status of the Eighth Edition of this well-known Handbook of Inorganic Chemistry. This news will be of particular interest to chemists and chemical librarians concerned with in-

organic and physical chemistry, metallurgy, geology, and crystallography.

The first five editions were brought out by Leopold Gmelin beginning in 1817. The publication of the 8th edition was begun in 1922 and until 1945 was prepared and published by the Deutschen Chemischen Gesellschaft, Berlin. With the dissolution in 1945 of the D.C.G., the work of preparation was taken over by an independent institute within the Max-Planck-Gesellschaft zur Förderung der Wissenschaften.

Many of the sections prepared before and during the war are now out of print but may eventually be made available in new photomechanical reprints if the demand warrants. In the period after the war, there were many initial obstacles to be overcome in obtaining literature. However, since 1949, new deliveries are being made rapidly. A new overall plan will assure the completion of the 8th edition in 10–12 years. The literature deadline for all outstanding volumes was set at January 1, 1950. Those portions already published will be brought up to this date with supplementary volumes.

The salvaged stock published before 1947 is available only as folded sheets, the later parts in bound form.

A 28-page prospectus may be obtained on request which describes the general plan and lists those portions still available and the forthcoming volumes. The sections published since 1949, including those now in press, cover: Oxygen, Selenium, Antimony, Magnesium, Calcium, Aluminum, Titanium, Gold, and Platinum.

Inquiries concerning the progress and plan of the work should be addressed to Gmelin-Institute (20b) Clausthal-Zellerfeld/Oberharz, Altenauer Str. 24. Questions concerning the availability of the various sections and other matters of publication should be sent to Verlag Chemie GMBH (17a) Weinheim a.d. Bergstr., Hauptstrasse 127, or to any American book importer such as: Walter J. Johnson, 125 East 23 Street, New York 10, or Stechert-Hafner, Inc., 31 East 10 Street, New York 3.

75 Years of Chemistry

CHEMISTRY . . . KEY TO BETTER LIVING. Edited and produced by the staffs of *Chemical and Engineering News* and *Industrial and Engineering Chemistry*. Published by the American Chemical Society, Washington, D. C., 1951. xxxi plus 244 pages, $4.00.

This volume is primarily a history of chemistry in America during the past 75 years and of the interrelation of the American Chemical Society and the American chemical industry as they have developed and progressed side by side during that period. A series of papers review the development of chemical science and its industrial applications, and discuss the part the ACS and its divisions played in the advancement of chemical knowledge and skill. This series subdivides chemistry roughly into the fields covered by the divisions of the ACS, and is presented approximately in the order in which the divisions were established. These histories are all written by outstanding leaders in the fields covered.

A special feature of the book is "The First 75 Years" by Anthony Standen. It is copiously illustrated and emphasizes the role the Society and its members played in the industrial chemical growth of the Nation. A picture-caption story graphically presents this same 75-year period. Other sections discuss contemporary problems as the scientist, philosopher, business executive, and teacher envision them.

In addition to the excellent make-up, arrangement, and typography, the volume is attractively bound in cobalt blue cloth, lettered in genuine gold leaf with the ACS emblem attractively displayed. It should be a valuable reference in the libraries of industrial concerns, research laboratories, and educational institutions.

BOOK REVIEWS

Three Introductions to Metallurgy

THE STORY OF METALS by John W. W. Sullivan. Published jointly by American Society for Metals, Cleveland, Ohio, and The Iowa State College Press, Ames, Iowa, 1951. x plus 290 pages, $3.00.

THE NATURE OF METALS by Bruce A. Rogers. Published by American Society for Metals, Cleveland, Ohio, and The Iowa State College Press, Ames, Iowa, 1951. vi plus 248 pages, $3.00.

THE STRUCTURE AND MECHANICAL PROPERTIES OF METALS, Royal Aeronautical Society Monograph Series, Vol. 2, by Bruce Chalmers. Published by John Wiley & Sons, Inc., New York, 1951. ix plus 132 pages, $3.50.

These three volumes are of the nature of introductory texts. The American Society for Metals' volumes are informal and require negligible technical background. They are evidently intended for the interested nonprofessional man or pre-college student. The third volume is suitable for the practicing or student engineer as an introduction to the relations existing between metallic properties and structure. A modicum of physics, chemistry, and preferably also of engineering properties of materials is necessary. Mathematics is not.

The Story of Metals is, in its first half, a brief history of metals from geologic times to the present, outlining related advances in technology and usage. The second half surveys the field of metals of present commercial importance, giving in general both applications and methods of recovery. There is a brief closing chapter on the "future of metals" which gently leads the unwary reader into speculative realms.

The book is unevenly and unrestrainedly written; the author's attempt to make it entertaining is commendable, but not often successful. In the first, historical part, the scholarship is careless. It is in the second, contemporary section, where he clearly knows whereof he writes, that the author is most accurate, convincing, and restrained. There he describes lucidly and with reasonable completeness the extraction and application of principal commercial metals (including titanium). While many omissions of pertinent nature can be found, they are unimportant in view of the intended scope and nature of the work.

The book is thoroughly and imaginatively illustrated.

The Nature of Metals, in the same self-education series as the foregoing, undertakes the difficult task of introducing physical metallurgy to the complete novice. The author has evidently put forth a large investment of time, good judgment, and careful writing.

The book begins with a description of the nature of metals, proceeds directly to microscopic examination and microstructure, and thence to atomic arrangement and space lattices, all in a natural and easily followed development which should cause no difficulty to an interested average high-school student. Alloying is next considered, first presenting examples of complete and limited solid solubility and eutectics. Constitution diagrams are simultaneously introduced.

The movement of atoms in the solid state and diffusion processes are then described. The effect of temperature on diffusion rate and on solid solubility are used to introduce precipitation

hardening. A discussion of phase transformations, using the iron-carbon system as example, leads naturally to the effect of cooling rate on the constituents and heat treatment of steels.

The slip process is described as a basis for plastic deformation, followed by a chapter on recrystallization. The final chapter gives some elements of oxidation and corrosion, including season-cracking and the stabilization of stainless steels.

The author has succeeded in covering these aspects of physical metallurgy with a clarity of thought and simplicity of expression that should make the book valuable to the reader first approaching the subject. There might have been included some specific references to slightly more advanced texts for further study, but there are references to over eighty original papers. Again the illustrations are ample and admirable.

Both volumes in this series are well indexed and feature glossaries of technical terms and questionnaires on each chapter.

The Structure and Mechanical Properties of Metals is a more formal and detailed presentation suited for an introductory college text. The first chapter describes atomic structure briefly, then crystal structure, crystal formation and growth, and dendridic, mosaic, and boundary structures in pure metals. The second chapter, on the structure of alloys, proceeds from solid solubilities through eutectics to intermetallic compounds and the eutectoid and peritectic transformations, illustrated by appropriate and important constitution diagrams.

The effect of distortion on structure is given in terms of the slip process and elementary dislocation theory. The effect of heat treatment on structure is approached from the standpoint of activation energy and rate of approach to equilibrium; the iron-carbon system and heat treatment of steels serve as examples, along with age-hardening and recrystallization after cold working. There is a brief chapter on the determination of structure.

The final chapter on mechanical properties covers the usual tensile properties, plastic and elastic, hardness, fracture, impact, creep, hot strength, fatigue, and damping capacity. Effects on these caused by structural alterations are described so far as possible. The thoughtful student may be disappointed at finding the correlation between structure and properties not more completely and fundamentally presented. This is not so much a shortcoming in the text as a result of our present state of metallurgical knowledge.

The viewpoint throughout is fundamental; purely practical aspects are mentioned but not emphasized. This book should be valuable to the practicing metallurgical engineer desirous of enhancing his fundamental background, and as an introduction to the physical basis of metallurgy for college science and engineering students.

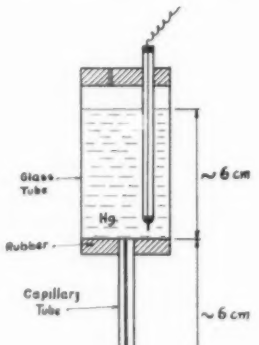
R. J. Treuting

LETTER TO THE EDITOR

Dropping Mercury Electrode

Dear Sir:

The flow of mercury through a capillary tube may assume an unusual form when the diameter of the bore has a critical value, in the neighborhood of 0.15 mm. The mercury appears to



stream out in a very thin jet, which when viewed with the aid of a stroboscope is seen to consist of closely spaced droplets. The drop-time is very small, approximately 0.05 sec with a pressure of 5–7 cm of mercury.

This flow differs considerably from any of the known pecularities observed with the dropping mercury electrode normally employed in polarographic work. The latter are characterized by their erratic occurrence while the abnormal flow described here is extremely regular and can be reproduced easily.

Convenient capillary tubes for observing this phenomenon may be prepared from broken thermometers with a scale range of $-10°$ to $+250°$; Kimble Glass Company thermometers have been found suitable. A convenient assembly of a dropping electrode is shown in the drawing. In order to start the flow, suction must be applied at the lower end of the tube. The abnormal flow is more easily observed if the capillary dips in a liquid, but will also take place in the open air.

The controlling factor of this type of flow seems to reside in the opening at the lower end of the tube and an appropriate opening must be obtained by trial and error. The presence of a liquid film on the internal walls of the capillary seems to have a strong influence, perhaps because of the electrical double layer on the liquid film. As a rule the abnormal flow can be stopped by anodic polarization of the dropping electrode, or by the presence of mercuric ions; in both cases the droplets return to their normal drop-time and size.

The cause of the abnormal flow is not as yet known. A dropping mercury electrode exhibiting this phenomenon is exceptionally suitable for oscillographic observations and research is being conducted in this direction.

Cyro P. Camargo
São Paulo, Brazil

RECENT PATENTS

Selected for electrochemists by Fred W. Dodson, Chairman of the Patent Committee, from the Official Gazette.

August 7, 1951

Hadley, R. F., 2,562,906, Primary Cell Construction

Schlumberger, M., 2,562,992, Well Logging System

Perley, G. A., 2,563,062, Electrostatic Shield for *p*H Electrodes

Faust, C. L., and Beach, J. G., 2,563,229, Method of Producing Bright Electroplate on Electropolished Surfaces

Godshalk, C. A., and Medlar, L. A., 2,563,234, Safety Thermal Control System for Battery Chargers

Shea, F. L. Jr., and Juel, L. H., 2,563,285, Manufacture of Carbon Electrodes

Phillips, W. M., and Clifton, F. L., 2,563,360, Electrodeposition of Copper

Spruance, F. P. Jr., 2,563,430, Method of Improving the Resistance to Corrosion and Abrasion of Certain Coated Aluminum Surfaces

Spruance, F. P. Jr., 2,563,431, Method of Improving the Resistance to Corrosion and Abrasion of Certain Coated Aluminum Surfaces

ten Boske, J. A., and Dorgelo, E. G., 2,563,434, Electron Discharge Tube Assembly

Albrand, W., 2,563,670, Regulating Apparatus for the Automatic Charging in Two Stages of a Battery of Accumulators

NOTES FROM INDUSTRY

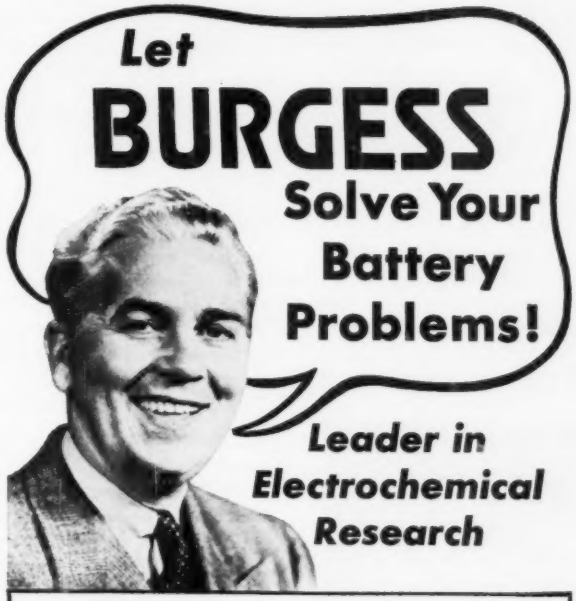
Products

DURO-JOINT, a new type of acid-proof joint for acid-proof piping, has been developed by The Electro Chemical Engineering & Mfg. Co., Emmaus, Pa. Duro-Joint is composed of a spiral wrapping of glass cloth and Lecite acid- and alkali-proof furan resin cement, using a special technique, and is equal in strength and chemical resistance to the pipe itself. The Duro-Joint replaces, in many instances, the flange type joint which is subject to corrosion, and it also may be used to repair broken pipe or to armor porcelain or stoneware. It can be made in the field without the use of heat or special equipment.

STUPALITH, the trade name for a series of new ceramic materials able to withstand extreme thermal shock—primarily through exceptionally low coefficients of expansion—has been developed by Stupakoff Ceramic & Manufacturing Company, Latrobe, Pa. It is being produced commercially in two principal types: with "zero" thermal expansion and with near-zero thermal expansion, either plus or minus.

This new material can be used at temperatures up to 2400°F, and is believed by the manufacturer to remain stable indefinitely. It is particularly adaptable for pickling bath containers, kiln furniture, and induction heating. It can also be used for plug-and-ring gauges, mirrors, turbine blades and jet turbines, combustion engine parts, etc.

"COPPERON" WIRES. New electroplated steel wires with heavy copper coating suitable for a wide range of industrial, electrical, and communications applications, have been announced by the Kenmore Metals Corporation, 380 Ninth Street, Jersey City 2, N. J. The heavy electroplated copper coating is permanently bonded to a low, medium, or high carbon steel core wire. Applications include: plating rack springs; power transmission, telephone



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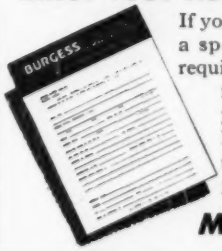

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and railway signal lines; television antennae and transmission lines; coaxial cables; heavy duty appliance cords; incandescent lamp leads; home applicances, etc. It is available in diameters ranging from $\frac{3}{4}$ inch to the finest wire gauge sizes.

NEW AIR SCALE. The F-C "air scale" Weight Transmitter, a completely pneumatic scale for either batch weighing or continuous process control has been announced by the Fluid Controls Company, Inc., 5150 Ridge Ave., Philadelphia 28, Pa. The new device ac-

curately converts a variable force or weight into an easily measured pneumatic signal. Uses range from simple weighing operations to elaborate batch or continuous flow control of either solids or liquids, and torque and thrust measurements of jet engines. Bulletin giving complete information is available.

MODIFIED KODAK HIGH SPEED Camera, which permits both the mechanical and electrical aspects of a subject to be recorded simultaneously on the same film, has been announced by the Eastman Kodak Company, Rochester, N. Y.

The modification consists of the addition of a second lens to the camera to record the images on the tube of a cathode-ray oscillograph through the back of the film, while the mechanical aspects of the subject are being photographed on the front. This record will present a complete picture of the behavior of electromechanical devices, and will also permit easy correlation with strain, acceleration, vibration, and other signals fed to the oscillograph in many nonelectrical problems. The oscillographic modification can be added to Kodak High Speed Cameras or Eastman High Speed Cameras Type III previously purchased.

PORTABLE VACUUM LEAK LOCATOR. A new and improved, portable, high-sensitivity leak locator, designed as a factory and laboratory device for detecting and locating tiny leaks during the manufacture of electron tubes of all types, vacuum bottles, or any device, large or small, which can be evacuated, has been announced by the RCA Scientific Instrument Section, Camden, N. J.

A hydrogen-sensitive, ionization-type instrument, the new RCA Leak Locator (Type EMV-7) weighs only 31 pounds and is simple enough to be operated by nontechnical personnel. It is capable of detecting leaks as small as 1×10^{-5} liter-microns of hydrogen per second.

Publications

AUTOMOTIVE RUBBER CATALOG. Automotive Rubber Company, Inc., Detroit, Mich., has prepared a new catalog completely describing their plant facilities, including their new rubber compounding mill and various products and services which they now have to offer. The company has long been identified with the automotive, electrical, chemical, and metal industries as a source for sheet-rubber lined tanks and form-dipped rubber parts sold under the Arco trade name. Copies of the catalog may be obtained without charge.

RECORDING OSCILLOGRAPH BULLETIN. The 5-114 Recording Oscillograph, a multi-channel, precision instrument for the analysis and measurement of strain, vibration, pressure, acceleration and other phenomena, is the subject of a fully illustrated technical bulletin (CEC Bulletin 1500B) just published by Consolidated Engineering Corporation, Pasadena, Calif. Write for free copy.

ORTHO-NITROBIPHENYL BULLETIN. Ortho-nitrobiphenyl, a low-cost primary plasticizer, compatible with a wide range of resins, both synthetic and natural, is described in detail in a technical bulletin available from Monsanto Chemical Company, Organic Chemicals Division, St. Louis, Mo. The 10-page bulletin contains suggested formulations of various resins and suppliers of materials in addition to physical, chemical, and test data (Technical Bulletin No. 0-78). Free on request.

VACUUM IMPREGNATION BROCHURE. The F. J. Stokes Machine Company, Philadelphia, Pa., has published a 32-page comprehensive book on the subject of vacuum impregnation in which the process is explained, a detailed list of applications is given, and equipment used in vacuum impregnation is described and pictured.

Vacuum impregnation, which introduces an impregnating agent into a chamber where a high vacuum has been drawn, is a versatile process used in many fields. Among its applications are insulation of electrical equipment, filling of thermometers and small bottles, and weather-proofing of papers and textiles. Available on request.

Personalities

HARRY R. GAMRATH has been appointed assistant director of research for the Organic Chemicals Division Monsanto Chemical Company, St. Louis, Mo. Also, J. R. VAN WAZER has been named assistant research director of Monsanto's Phosphate Division research department at Anniston, Ala.

JAMES F. EVERSOLE has been named manager of Research Administration of Union Carbide and Carbon Corporation. Dr. Eversole will help coordinate the research activities of all of the Corporation laboratories where basic research and development work is being done.

CORNING GLASS WORKS, Corning, N. Y., has announced the following executive promotions: John L. Ward has been appointed assistant controller of the company. John L. Hanigan will succeed Mr. Ward as general manager of the Electrical Products Division. Other promotions include Normal J. Vang, who becomes the new divisional manufacturing manager; Paul T. Clark has been named manager of the company's Pressware Plant in Corning; and Julian H. Allen has been appointed manager of the Fall Brook Plant.

HAROLD C. WEINGARTNER has been elected vice-president and general manager of the Equipment Division of National Research Corporation, Cambridge, Mass.

EMPLOYMENT SITUATION

Please address replies to box shown, c/o The Electrochemical Society, Inc., 235 W. 102nd St., New York 25, N. Y.

Position Wanted

RESEARCH DIRECTOR. Metallurgical chemist, with broad experience in metal finishing, electroplating, corrosion, ferrous and nonferrous metallurgy, and quality control, seeks equivalent position. *Reply to Box 346.*

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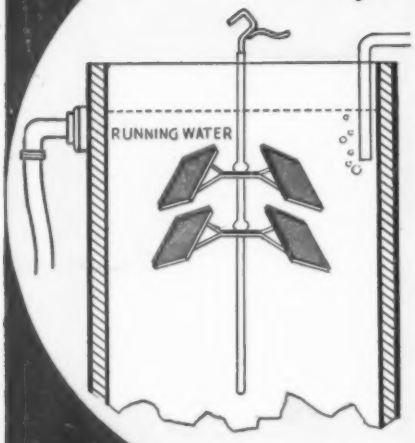
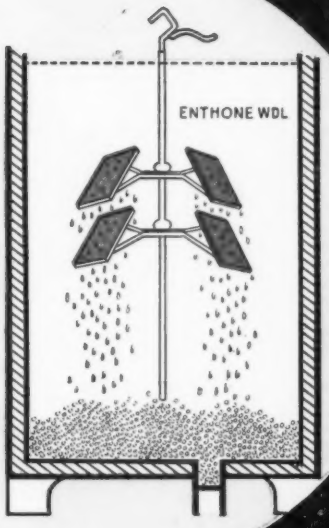
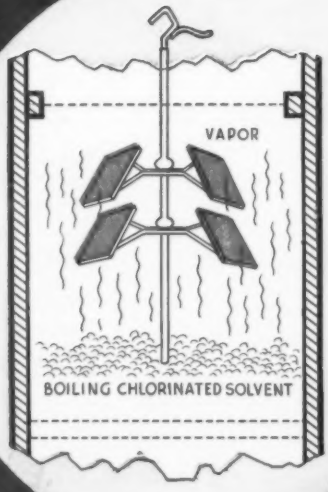
How **THE NEW ENTHONE WATER DISPLACING LIQUID DRIES METALS FAST AND STAIN-FREE**



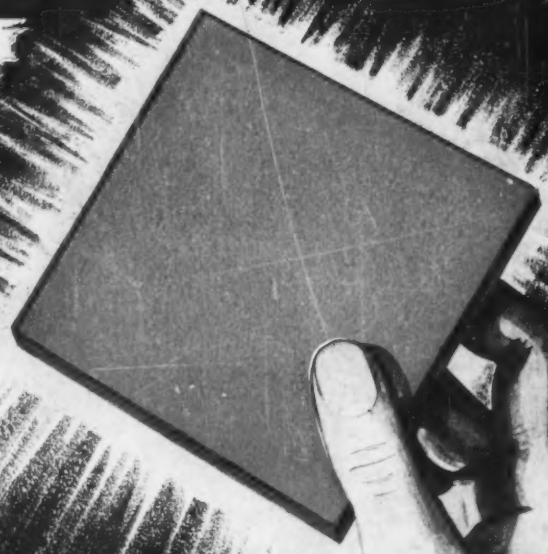
After plating, cleaning or acid treatment rinse with running water or pressure spray.

Water sheds from work in 5 seconds in Enthone Water Displacing Liquid.





Remove Water Displacing Liquid in 10 seconds by vapor degreaser or let W.D.L. evaporate at room temperature.



at the end of one minute

Water Displacing Liquid is now used for stain-free quick drying of silver, gold, brass, zinc, cadmium and oxidized finishes. Eliminates staining during drying on damp days. No longer is sawdust and air blast drying necessary. Excellent for complicated shapes and creviced surfaces.

ENTHONE *Inc.*

442 ELM STREET
NEW HAVEN 2, CONN.